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IT-MC-CK05-0085
Project No. 774645

Mr. Ellis Pope
U.S. Army Corps of Engineers
Mobile District
Attn: CESAM-EN-GE (Pope)
109 Joseph Street
Mobile, Alabama 36628-0001

Contract: Contract No. DACA21-96-0018/CK005
Fort McClellan, Alabama

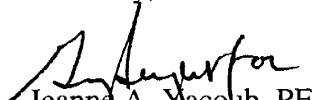
Subject: Final Site-Specific Work Plans for Fort McClellan

Dear Mr. Pope:

I am enclosing three copies of the final work plans for Package 7 for your records. These plans incorporate the review comments we discussed and resolved during our December 1998 meeting. These plans describe the activities we will conduct at the Fill Area West of Range 19 (EBS Parcel 233).

I have distributed copies of this document according to the distribution list indicated below. If you have questions or need further information, please contact me at (303) 793-5250.

Sincerely,


Jeanne A. Jacob, PE
Project Manager

Attachments

Lisa Kingsbury, Fort McClellan (6 copies)
Bart Reedy, EPA Region IV (1 copy)
Hugh Vick, Gannett Fleming (3 copies)
Joe King, AEC (1 copy)

Chris Johnson, ADEM (2 copies)
Bobby Lewis, EPA Athens (1 copy)
Dennis Druck, CHPPM (6 copies)
Project Files

**Final
Site Investigation
Site-Specific Field Sampling Plan and
Site-Specific Safety and Health Plan Attachment
Fill Area West of Range 19, Parcel 233(7)**

**Fort McClellan
Calhoun County, Alabama**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

December 1998

Site-Specific Field Sampling Plan

Fill Area West of Range 19, Parcel 233(7)

Site Investigation

**Final
Site-Specific Field Sampling Plan Attachment
for the Fill Area West of Range 19
Parcel 233(7)**

**Fort McClellan
Calhoun County, Alabama**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

December 1998

Revision 1

Table of Contents

	<i>Page</i>
List of Tables	iii
List of Figures	iii
List of Acronyms.....	iv
Executive Summary	ES-1
1.0 Project Description.....	1-1
1.1 Introduction.....	1-1
1.2 Site Description	1-1
1.3 Scope of Work.....	1-2
2.0 Summary of Existing Environmental Studies	2-1
3.0 Site-Specific Data Quality Objectives.....	3-1
3.1 Overview	3-1
3.2 Data Users and Available Data.....	3-1
3.3 Conceptual Site Exposure Model	3-2
3.4 Decision-Making Process, Data Uses, and Needs	3-3
3.4.1 Risk Evaluation	3-3
3.4.2 Data Types and Quality	3-3
3.4.3 Precision, Accuracy, and Completeness	3-4
4.0 Field Activities	4-1
4.1 UXO Survey Requirements and Utility Clearances.....	4-1
4.1.1 Surface UXO Survey	4-1
4.1.2 Downhole UXO Survey.....	4-1
4.1.3 Utility Clearances	4-1
4.2 Surface Geophysical Survey	4-1
4.2.1 Methodology and Instrumentation.....	4-2
4.2.2 Areal Coverage	4-4
4.3 Environmental Sampling	4-5
4.3.1 Surface Soil Sampling	4-5
4.3.1.1 Sampling Locations and Rationale.....	4-5

Table of Contents (Continued)

	<i>Page</i>
4.3.1.2 Sample Collection	4-5
4.3.2 Subsurface Soil Sampling.....	4-5
4.3.2.1 Sample Locations and Rationale.....	4-5
4.3.2.2 Sample Collection	4-6
4.3.3 Groundwater Sampling.....	4-6
4.3.3.1 Sampling Locations and Rationale.....	4-6
4.3.3.2 Sample Collection	4-7
4.3.4 Depositional Soil Sampling.....	4-7
4.3.4.1 Sampling Locations and Rationale.....	4-7
4.3.4.2 Sample Collection	4-8
4.4 Decontamination Requirements	4-8
4.5 Surveying of Sample Locations	4-8
4.6 Analytical Program.....	4-8
4.7 Sample Preservation, Packaging, and Shipping	4-9
4.8 Investigation-Derived Waste Management	4-9
4.9 Site-Specific Safety and Health	4-10
5.0 Project Schedule.....	5-1
6.0 References	6-1

List of Tables

<i>Number</i>	<i>Title</i>	<i>Follows Page</i>
3-1	Summary of Data Quality Objectives	3-1
4-1	Sample Locations and Rationale	4-5
4-2	Soil Sample Designations and QA/QC Sample Quantities	4-5
4-3	Groundwater Sample Designations and QA/QC Sample Quantities	4-7
4-4	Analytical Samples	4-9

List of Figures

<i>Number</i>	<i>Title</i>	<i>Follows Page</i>
1-1	Site Location Map, Fill Area West of Range 19, Parcel 233(7)	1-1
1-2	Site Map, Fill Area West of Range 19, Parcel 233(7)	1-1
3-1	Human Health Conceptual Site Exposure Model	3-3
4-1	Proposed Sample Locations, Fill Area West of Range 19, Parcel 233(7)	4-5

List of Acronyms

ADEM	Alabama Department of Environmental Management
bgs	below ground surface
CLP	Contract Laboratory Program
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CSEM	conceptual site exposure model
DOD	U.S. Department of Defense
DQO	data quality objective
E-W	east to west
EBS	environmental baseline survey
EM	electromagnetic
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FTMC	Fort McClellan
GPR	ground-penetrating radar
GPS	global positioning system
IDW	investigation-derived waste
IT	IT Corporation
N-S	north to south
PID	photoionization detector
PSSC	potential site-specific chemical
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SI	site investigation
SSH	site-specific safety and health plan
USACE	U.S. Army Corps of Engineers
UXO	unexploded ordnance
WP	installation-wide work plan
UST	underground storage tank

Executive Summary

In accordance with Contract No. DACA21-96-D-0018, Delivery Order CK005, IT Corporation (IT) will conduct site investigation activities at the Fill Area West of Range 19, Parcel 233(7), to determine the presence or absence of potential site-specific chemicals at this site. The purpose of this site-specific field sampling plan (SFSP) is to provide technical guidance for sampling activities at the Fill Area West of Range 19. The site is located in the southeastern area of the Fort McClellan (FTMC) Main Post. Parcel 233(7) is located approximately 550 feet west of Iron Mountain Road. The area was used as a site where metal debris, tin, drums, rocks, and other materials were dumped. Documentation regarding the type of material placed at this location is not available. A surface geophysical survey will be performed to determine the boundaries and extent of the fill area.

Specifically, IT will collect six surface soil samples, six subsurface soil samples, four groundwater samples, and one depositional soil sample at this site. Potential contaminant sources at the site are unknown. Therefore, chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, metals, chlorinated pesticides, polychlorinated biphenyls, chlorinated herbicides, and organophosphorus pesticides. Results from these analyses will be compared with site-specific screening levels specified in the installation-wide work plan (WP) and regulatory agency guidelines.

The Fill Area West of Range 19, Parcel 233(7) falls within the "Possible Explosive Ordnance Impact Area" shown on Plate 10 of the FTMC Archive Search Report, Maps (U.S. Army Corps of Engineers, 1998a). Therefore, IT will conduct unexploded ordnance avoidance activities, including surface sweeps and downhole surveys of soil borings.

This SFSP attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for the Fill Area West of Range 19 will be used in conjunction with the site-specific safety and health plan (SSHP), the installation-wide WP (IT, 1998b), the habitat-specific screening ecological risk assessment work plan, and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, and quality assurance plan. Site-specific hazard analyses are included in the SSHP.

1.0 Project Description

1.1 Introduction

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Calhoun County, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Fill Area West of Range 19, Parcel 233(7) under Delivery Order CK005, Contract No. DACA21-96-D-0018.

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT, 1998a) for FTMC has been prepared to provide technical guidance for sample collection and analysis at the Fill Area West of Range 19, Parcel 233(7). This SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the Fill Area West of Range 19, Parcel 233(7), the installation-wide work plan (WP) (IT, 1998b), the habitat-specific screening and ecological risk assessment work plan, and the SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and the installation-wide quality assurance plan (QAP).

1.2 Site Description

The Fill Area West of Range 19, Parcel 233(7) is located in the southwestern area of the FTMC Main Post (Figure 1-1). Parcel 233(7) is located approximately 550 feet west of Iron Mountain Road and immediately southwest of an unnamed asphalt road. The parcel covers approximately 1 acre, although the boundaries of the parcel are not defined. Parcel 232(7), Mounded Material West of Range 19, is located approximately 200 feet northwest of the Fill Area Parcel 233(7) (Figure 1-2). Parcel 233(7) site is identified from a 1949 aerial photo composite (U. S. Environmental Protection Agency [EPA], 1990). Information is not available regarding the type of material placed at this location. The boundaries of the parcel are not well defined.

Based upon field observations, the width of the parcel varies from 100 to 150 feet (northwest to southeast) at certain areas, and approximately 200 feet long (northeast to southwest). The site slopes gently to the southeast. Vegetation across the parcel varies. The northern area of the parcel is thickly populated with large pine trees. In other areas of the parcel, vegetation is sparse. In the southern portion of the parcel, the walkover team observed rocks, metal debris, tin dirt mounds, and drums partially exposed at the surface. There is tributary of Remount Creek approximately 220 feet east of Iron Mountain Road which flows in a northeasterly direction.

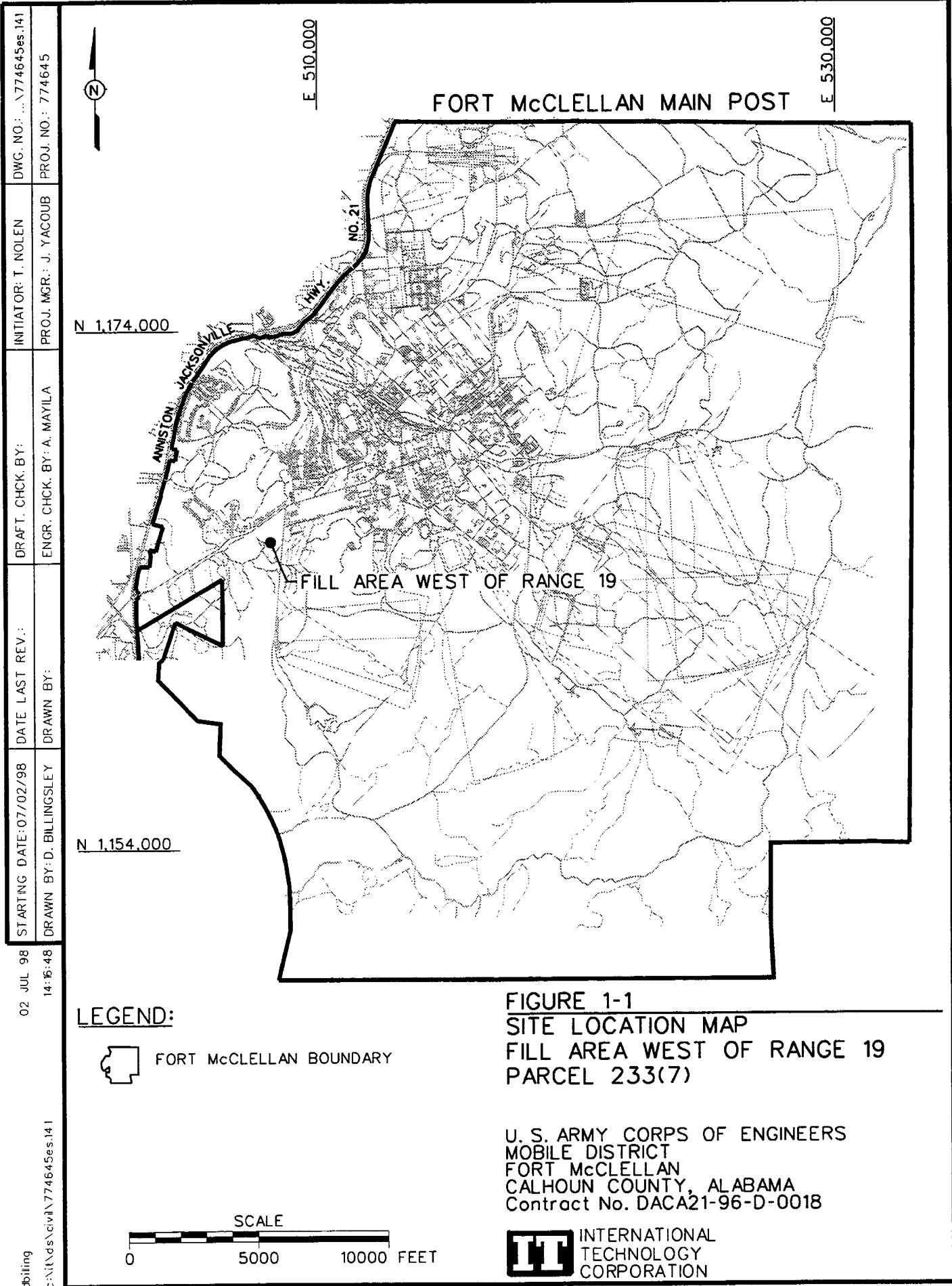
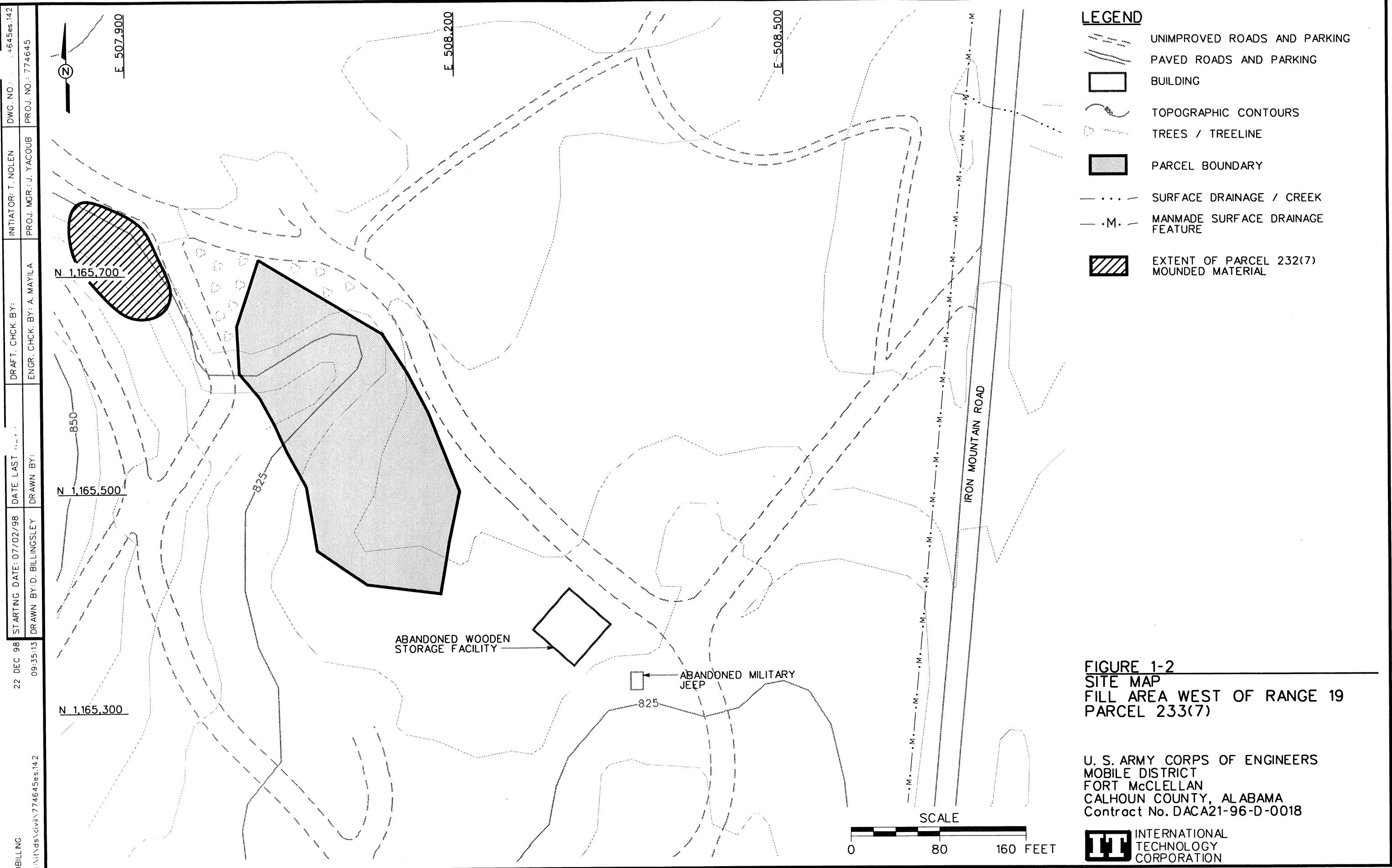


FIGURE 1-1
SITE LOCATION MAP
FILL AREA WEST OF RANGE 19
PARCEL 233(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018



INTERNATIONAL
TECHNOLOGY
CORPORATION



During the site visit by IT (June, 1998), the tributary was observed to be dry. A man-made drainage ditch west of Iron Mountain Road flows in a north-south direction. Shallow groundwater at the site is probably controlled by surface drainage and/or topography and is likely to the southeast. Site elevation ranges from 815 to 825 feet above sea level as established by the National Geodetic Vertical Datum. An abandoned wooden storage facility adjacent to an old coal bunker is located approximately 100 feet south of the parcel. Further to the southeast of the abandoned storage facility is an abandoned military jeep. Information is not available on the material stored or the previous use of this facility.

From review of previous reports, the dates which the Fill Area West of Range 19 was used could not be determined.

The soil type at the Fill Area West of Range 19 is Anniston and Allen gravelly clay loam, which is a severely eroded soil with poor infiltration and moisture capacity. These soils are formed either by erosional forces, surface runoff, or natural reworking processes. Colors are typically reddish-brown. The depth to bedrock or groundwater is typically from 2 feet below ground surface (bgs) to greater than 10 feet bgs. Groundwater is typically greater than 20 feet bgs. The high erosion hazard, low capacity for available moisture, and thin root zone make this soil poorly suited for cultivation (U.S. Department of Agriculture, 1961).

1.3 Scope of Work

The scope of work for activities associated with the SI at the Fill Area West of Range 19, Parcel 233(7), specified by the statement of work (USACE, 1998), includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Conduct a surface and near surface unexploded ordnance (UXO) survey over all areas to be included in the sampling effort.
- Provide downhole UXO support for all intrusive drilling to determine potential buried downhole hazards.
- Perform a geophysical survey to determine the location and extent of the fill area.
- Collect six surface soil samples, six subsurface soil samples, four groundwater samples, and one depositional soil sample to determine whether potential site-

specific chemicals (PSSC) are present at the Fill Area West of Range 19, Parcel 233(7).

At completion of the field activities and sample analyses, draft and final summary reports will be prepared to evaluate the absence or presence of PSSC at this site, and to recommend further actions, if appropriate. Reports shall be prepared in accordance with current EPA Region IV and Alabama Department of Environmental Management (ADEM) requirements.

2.0 Summary of Existing Environmental Studies

Environmental Science and Engineering, Inc. (ESE) conducted an environmental baseline survey (EBS) to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance for fast track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release, or disposal (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

The Fill Area West of Range 19, Parcel 233(7) is identified as a CERFA site. This CERFA parcel is a Category 7 area. The parcel site is an area where rocks, metal debris, tin, dirt mounds, and drums, partially exposed at the surface, have been observed. PSSCs may have been released onto the site or to the environment, as materials were disposed of on site property. The Fill Area

West of Range 19, Parcel 233(7) lacks adequate documentation and, therefore, requires additional evaluation to determine the environmental condition of the parcel. Surface soil, subsurface soil, and groundwater are the media of potential concern.

3.0 Site-Specific Data Quality Objectives

3.1 Overview

The data quality objectives (DQO) process is followed to establish data requirements. This process ensures that the proper quantity and quality of data are generated to support the decision-making process associated with the action selection for the Fill Area West of Range 19, Parcel 233(7). This section incorporates the components of the DQO process described in the EPA publication *EPA 540-R-93-071 Data Quality Objectives Process for Superfund, Interim Final Guidance* (EPA, 1993). The DQO process as applied to the Fill Area West of Range 19, Parcel 233(7) is described in more detail in Section 4.3 of the WP (IT, 1998b). Table 3-1 provides a summary of potential users or data, the media of concern, the suite of analyses to be performed, and the quantity of samples proposed to be collected during the SI.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hardcopy packages by the laboratory in Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

3.2 Data Users and Available Data

The intended data users and available data related to the SI at the Fill Area West of Range 19, Parcel 233(7), presented in Table 3-1, have been used to formulate a site-specific conceptual model presented in Section 3.3. This conceptual model was developed to support the preparation of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for the data and information generated during field activities are primarily the EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide the level of defensible data and information required to confirm or rule out the existence of residual PSSCs in the site media.

Table 3-1

Summary of Data Quality Objectives
Site Investigation
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA, ADEM USACE, DOD FTMTC, IT Corporation Other contractors, and possible future land users	None	<u>Contaminant Source</u> Fill Area (unknown materials in a dump site)	<u>Surface Soil</u> <u>Subsurface Soil</u> <u>Groundwater</u>	SI to determine the presence or absence of PSSCs in the site media	<u>Surface soil</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	6 direct-push soil samples + QC

		<u>Migration Pathways</u> Infiltration to subsurface soil, infiltration and leaching to groundwater, dust emissions, VOC volatilization, and groundwater discharge to surface water.		Definitive quality data for future decision making	<u>Subsurface Soil</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	6 direct-push soil samples + QC
		<u>Potential Receptors</u> Groundskeeper (future) Construction worker (future) Resident (future) Recreational site user (current and future) Venison consumption (current and future)			<u>Groundwater</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	4 groundwater (temporary well) samples + QC
		PSSC		Unknown dump site materials	<u>Depositional Soil</u> TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides	Definitive data in CESAS Level B data packages	1 depositional soil sample

ADEM - Alabama Department of Environmental Management.

CESAS - Corps of Engineers South Atlantic Savannah.

DOD - U.S. Department of Defense.

EPA - U.S. Environmental Protection Agency.

FTMTC - Fort McClellan.

PSSC - Potential site-specific chemicals.

QC - Quality control.

VOC - Volatile organic compound.

SI - Site investigation.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target Compound list.

USACE - U.S. Army Corps of Engineers.

3.3 Conceptual Site Exposure Model

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating the potential risks to human health to support the risk assessment. The CSEM includes all plausible receptor scenarios and potential exposure pathways. The CSEM graphically presents possible pathways by which a potential receptor may be exposed, including sources, release and transport pathways, and exposure routes. In addition, it facilitates consistent and comprehensive evaluation of human health risks, and helps ensure that potential pathways are not overlooked. The elements necessary to construct a complete exposure pathway and develop the CSEM include:

- Source (i.e., contaminated environmental) media
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptor scenarios
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not required to identify receptor contact scenarios with contaminated source media.

Parcel 233(7) is an abandoned fill area that includes rocks, metal debris, and mounds of dirt intermingled with drums partially exposed at the surface. The precise contents of the fill area are not known. Because usage history or SI data are not available to precisely determine the list of plausible contaminants at the site, all reasonable contaminants and pathways are included.

Future site use is uncertain. It is likely that the area will remain unused and not become part of an industrial site or residential neighborhood (FTMC, 1997). Primary contaminant releases were probably to subsurface as well as surface soil. Potential contaminant transport pathways include infiltration to subsurface soil; infiltration and leaching to groundwater; discharge of groundwater to the surface; and, dust emissions and volatilization to ambient air. Media of concern include surface and subsurface soil and groundwater.

Plausible receptors identified in the CSEM include:

- The resident scenario, although highly unlikely, is considered for future purposes only, because there are currently no residents present at the site.
- The groundskeeper scenario, although highly unlikely, is considered for future purposes only, because the site is currently not maintained by a groundskeeper.
- The construction worker scenario is considered for future purposes only, because the site is currently not under construction.

- The recreational site user scenario, which includes hunting, youthful and other intruders, hikers, campers, and other recreational users, is considered for both current and future purposes, although it is not known with certainty that the site is currently used for any of these activities.
- The venison consumption scenario is considered for both current and future purposes, as associated hunting activities may currently take place at the site and probably will take place in the future.

The fish consumption scenario is excluded, because there are no relevant bodies of water in the area suitable for fishing. A summary of relevant contaminant release and transport mechanisms, source and exposure media, receptors, and exposure pathways is provided in Table 3-1 and Figure 3-1.

3.4 Decision-Making Process, Data Uses, and Needs

The decision-making process consists of a seven-step process that is presented in detail in Sections 3.2 and 4.3 of the WP and will be followed during the SI at the Fill Area West of Range 19, Parcel 233(7). Data uses and needs are summarized in Table 3-1.

3.4.1 Risk Evaluation

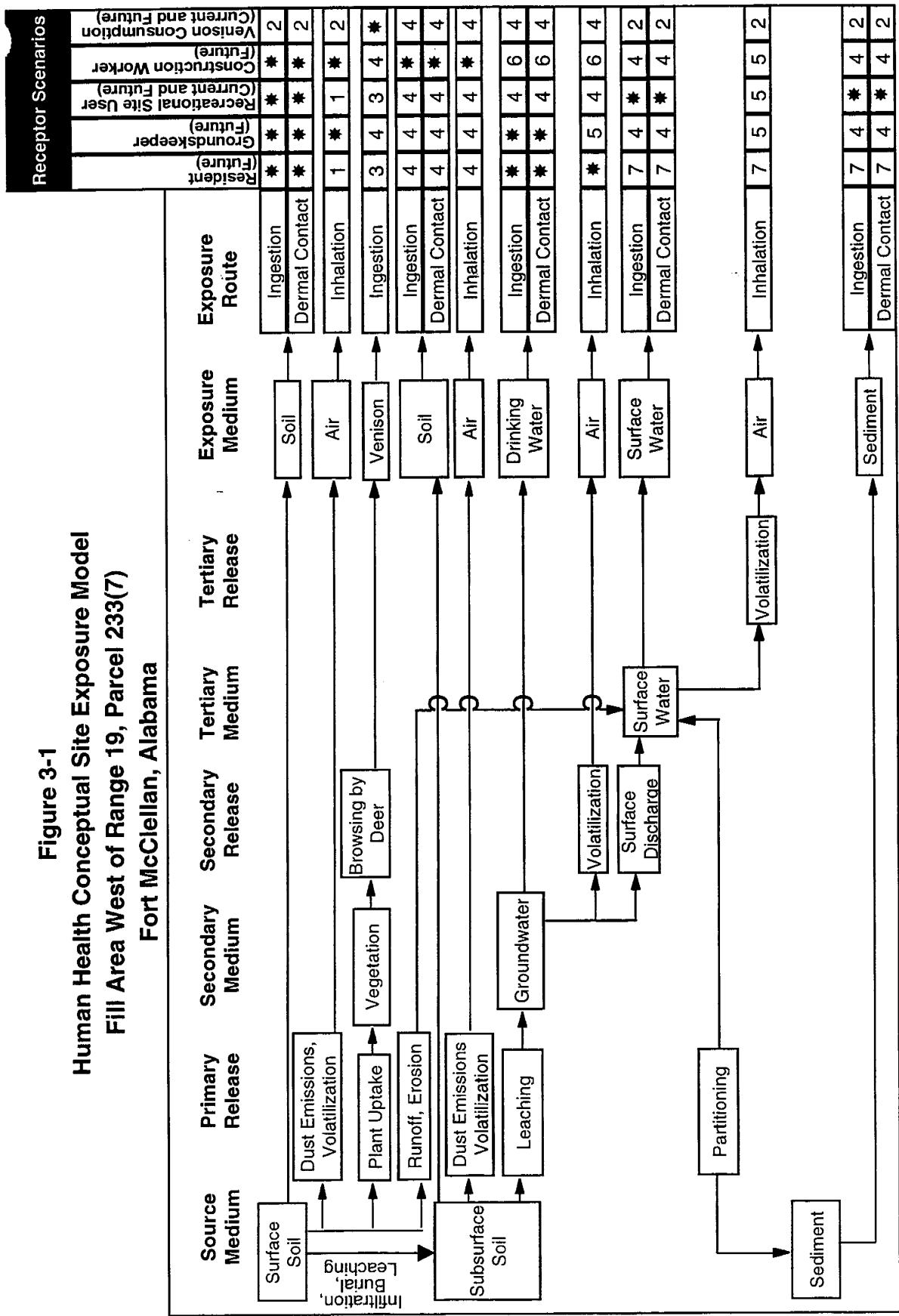
Confirmation of contamination at the Fill Area West of Range 19, Parcel 233(7), will be based on comparing detected PSSC concentrations with site-specific screening levels and background concentrations developed in the WP. EPA definitive data with CESAS Level B data packages will be used to achieve detection limits sufficient to determine whether or not the established guidance criteria are exceeded in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting a feasibility study and risk assessment.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) is addressed in the installation-wide WP.

3.4.2 Data Types and Quality

Surface and subsurface soil and groundwater samples will be collected and analyzed to meet the objectives of the SI at the Fill Area West of Range 19, Parcel 233(7). Quality assurance/quality control (QA/QC) samples will be collected for all sample types as described in Chapter 4.0 of this SFSP. Samples will be analyzed by EPA-approved SW-846 methods, including Update III methods where applicable. Samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported using hard copy data

Figure 3-1
Human Health Conceptual Site Exposure Model
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Alabama



* = Complete exposure pathway quantified in SSSL development.

1 = Volatilization from undisturbed surface soil deemed insignificant; soil is likely to be paved or vegetated, reducing dust emissions to insignificant levels; inhalation pathway not quantified.

2 = This scenario is created to assess indirect (food chain) exposure to surface soil, surface water and sediment.

3 = Evaluated under venison and fish consumption scenario.

4 = Incomplete exposure pathway.

5 = Although theoretically complete, this pathway is judged to be insignificant.

6 = Although theoretically complete, these pathways are not quantified for the construction worker because SSSLs developed for the construction worker would be at least as restrictive.

7 = Although theoretically complete, SSSLs for these pathways are developed only for the recreational site user. SSSLs developed for the recreational site user may be used to estimate risk for this receptor.

packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

3.4.3 Precision, Accuracy, and Completeness

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Chapter 9.0 of the QAP.

4.0 Field Activities

4.1 UXO Survey Requirements and Utility Clearances

The Fill Area West of Range 19 site falls within the “Possible Explosive Ordnance Impact Area” shown on Plate 10 of the FTMC Archive Search Report, Maps (USACE, 1998a). Therefore, IT will conduct UXO avoidance activities, including surface sweeps and downhole surveys of soil borings in addition to conducting utility clearances before installing soil borings.

4.1.1 Surface UXO Survey

An UXO sweep will be conducted over areas that will be included in the sampling and surveying activities to identify UXO on or near the surface that may present a hazard to on-site workers during field activities. Low-sensitivity magnetometers will be used to locate surface and shallow-buried metal objects. UXO located on the surface will be identified and conspicuously marked for easy avoidance. UXO personnel requirements, procedures, and detailed descriptions of the geophysical equipment to be used are provided in Chapter 4.0 and Appendices D and E of the approved SAP (IT, 1998a).

4.1.2 Downhole UXO Survey

During the soil boring and downhole sampling activities, a downhole UXO survey will be performed to determine if buried metallic objects are present. UXO monitoring, as described in Chapter 4.0 of the SAP (IT, 1998a), will continue until undisturbed soils are encountered or the borehole has been advanced to 12 feet below ground surface (bgs), whichever is reached first.

4.1.3 Utility Clearances

After the UXO surface survey has cleared the area to be sampled and prior to performing any intrusive sampling, a utility clearance will be performed at all locations where soil and groundwater samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the FTMC installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are approved (for both UXO and utility avoidance) for intrusive sampling, the stakes will be labeled as cleared.

4.2 Surface Geophysical Survey

A surface geophysical survey using magnetics, time- and frequency-domain electromagnetic (EM) induction, and ground-penetrating radar (GPR) techniques will be conducted over the Fill

Area West of Range 19 to locate and delineate the horizontal extent of the fill area. Due to thick vegetation present at this site, a global positioning system (GPS) will be used to provide geophysical survey control. Geophysical survey techniques offer the best approach to locating and mapping potential landfill areas and any subsurface anomalies.

4.2.1 Methodology and Instrumentation

The magnetic surveys will be conducted using a Geometrics G-858G magnetic gradiometer (for collecting survey data) and a Geometrics G-856AX magnetometer or equivalent (for collecting base station data). The time-domain EM surveys will be conducted using a Geonics EM61 high-resolution metal detector coupled to an Omnidata DL720 digital data logger. Frequency-domain EM surveys will be conducted using a Geonics EM31 and EM34-3XL terrain conductivity meter, each coupled to an Omnidata DL720 digital data logger. Use of the G-858G and the EM31 is the preferred method of detecting tanks; however, in areas of significant cultural interference (e.g., structures, fences, reinforced concrete), the EM61 will be employed, since this system is less affected by surface culture. The EM34-3XL surveys will be conducted based on site-specific conditions in which deep burial of target materials is suspected. The GPR survey will be conducted using a Geophysical Survey Systems Inc. System-2P or equivalent, coupled to either 200- or 400-megahertz antennas, depending on site conditions and signal attenuation. If required, a Metrotech 9860-NRL EM utility locator or equivalent will be used to confirm the presence or absence of metallic subsurface utilities, which may be evident as linear anomalies in the EM31 or EM61 contour maps.

Geophysical survey procedures to be used to conduct the investigation, including survey control, equipment calibration, field base station and data validation, data processing and interpretation, and file tracking procedures, will be in accordance with the methods and procedures outlined in Chapter 4.0 of the SAP (IT, 1998a) and the following IT standard operating procedures for geophysical investigations:

- ITGP-001: Surface Magnetic Surveys
- ITGP-002: Surface Frequency-Domain Electromagnetic Surveys
- ITGP-003: Ground-Penetrating Radar Surveys
- ITGP-004: Surface Time-Domain Electromagnetic Surveys
- ITGP-005: Global Positioning System Surveys.

The following tasks will be performed prior to conducting the survey:

- Review existing site surface and subsurface information (e.g., aerial photographs and utility maps, etc.).
- Evaluate the potential influence of cultural features (e.g., overhead and subsurface utilities, fences, buildings, etc.).
- Conduct a visual inspection of the sites to verify the likely boundaries of the fill area.
- Conduct reconnaissance scans across the general area of the fill area with the magnetic and/or EM instruments to determine whether geophysical anomalies exist within the proposed survey areas and/or near the proposed boundaries. The geophysical survey area boundaries for each site will be chosen in the field based on these results.

Following visual inspection of the site and evaluation of reconnaissance scans with the instruments, a base grid will be staked throughout the site such that the resolution objectives of the investigation are achieved (typically 10- to 20-foot centers). The base grid will be established using the GPS surveying technique. The geophysics base grid will be referenced to the Alabama State Plane Coordinate System. Using the base grid as a reference, the vegetation removal crew will clear approximately 3-foot-wide lanes through the brush. Following brush removal, the geophysics crew will use the GPS to establish control points on 20-foot centers throughout the site. The control points will be marked with surveyor's paint and/or plastic pinflags. To the extent possible, the grids will be oriented in the north to south (N-S) direction. If surface metal is present, it shall be removed where possible prior to collecting geophysical data.

After the survey grids are complete and control points are marked, all surface objects that could potentially affect the geophysical data (e.g., surface metal, variations in topography, overhead utilities, etc.) will be mapped using the GPS so that anomalies caused by these objects can be correctly interpreted.

Geophysical data processing will be completed in the field following the survey. The EM and magnetic data will be presented as color-enhanced contour maps to facilitate recognition of subtle anomalies. Geophysical anomalies will be field-checked to verify their source as either surface culture or subsurface objects/debris. Surface source materials responsible for the observed geophysical anomalies will be documented on the contour maps. Anomalies caused by subsurface source materials the size of an underground storage tank (UST) will be marked in the

field for further characterization with GPR. GPR will be used to discriminate between anomalies caused by USTs and those potentially caused by pits containing significant metal debris.

The conclusions from the geophysical survey at this site will be incorporated into the SI report and a geophysics report will be provided as an appendix to the SI report.

4.2.2 Areal Coverage

The Fill Area West of Range 19 site geophysical surveys will encompass the area shown in Figure 1-2. The following is a list of steps that will be performed at the site:

- G-858G magnetic gradiometer data will be collected at 0.5-second intervals (approximate 2.0- to 2.5-foot intervals) along N-S oriented survey lines spaced 5 feet apart.
- EM31 survey data will be collected at 5-foot intervals along N-S and east to west (E-W) oriented survey lines spaced 10 feet apart.
- EM34-3XL survey data will be collected, if necessary, using the 10- and 20-meter intercoil spacing configuration. Data will be collected in the vertical and horizontal dipole orientations at 2.5-meter intervals along N-S oriented survey lines spaced 2.5 meters apart.
- EM61 survey data will be collected at approximate 2-foot intervals along N-S and E-W oriented survey lines spaced 5 feet apart.
- GPR profile data will be collected to further characterize anomalies potentially representing the USTs seen in the magnetic and/or EM data. The orientation and length of the GPR lines will be chosen in the field to yield the most usable results.
- In areas of the site where linear EM31 or EM61 anomalies potentially representing pipelines/utilities are observed in the contoured data, the lines will be verified with the Metrotech 9860-NRL EM utility locator. Verification is necessary since the anomalous response caused by subsurface utilities may sometimes be mistaken for large buried metal objects. The locations of interpreted pipelines will be marked in the field with surveyor's paint and placed on the site map.

It is anticipated that three of the geophysical surveys described will be conducted: G-858G magnetic gradiometer, EM31, and EM61. However, as field conditions dictate, some or all of the survey techniques will be utilized. Due to the limited information about the fill area, the most efficient reconnaissance process will be to address the complete site with the geophysical surveys instead of targeting any specific part of the site.

4.3 Environmental Sampling

The environmental sampling program during the SI at the Fill Area West of Range 19, Parcel 233(7) includes the collection of six surface soil samples, six subsurface soil samples, four groundwater samples, and one depositional soil sample for chemical analyses. These samples will be collected and analyzed to provide data for characterizing the site to determine the environmental condition of the site and any further action to be conducted at the site.

4.3.1 Surface Soil Sampling

Surface soil samples will be collected from six soil borings installed at the Fill Area West of Range 19, Parcel 233(7).

4.3.1.1 Sampling Locations and Rationale

The surface soil sampling rationale is provided in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact surface soil sampling locations will be determined in the field by the on-site geologist based on actual field conditions and the results of the geophysical survey.

4.3.1.2 Sample Collection

Surface soil samples will be collected from the upper 1 foot of soil by direct-push technology in accordance with the procedures specified in Sections 4.7.1.1 of the SAP. Collected soil samples will be screened (for information only, not to select which sample is analyzed) using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. Sample documentation and chain-of-custody will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.3.2 Subsurface Soil Sampling

Subsurface soil samples will be collected from six soil borings installed at the Fill Area West of Range 19, Parcel 233(7).

4.3.2.1 Sample Locations and Rationale

Subsurface soil samples will be collected from the six soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is presented in Table 4-1. Subsurface soil sample designa-

Table 4-1

Sample Locations and Rationale
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

Sample Designation	Media Sampled	Sampling Location Rationale ^a
PPMP-233-GP01	Surface Soil Subsurface Soil	Direct-push samples will be collected at the highest elevation within the study parcel in the southwest area to determine if PSSC are present.
PPMP-233-GP02	Surface Soil Subsurface Soil	Direct-push samples will be collected at a point midway along the irregular northeastern boundary of the study parcel. This sampling location represents a likely source point for the collection and contaminant(s) deposited at the site.
PPMP-233-GP03	Surface Soil Subsurface Soil Groundwater	Direct-push samples will be collected at the northeast area of the study parcel. This sampling location represents a likely point for the collection and infiltration of runoff exiting the site.
PPMP-233-GP04	Surface Soil Subsurface Soil Groundwater	Direct-push samples will be collected at the lowest elevation within the study parcel, where runoff may collect before infiltrating to the subsurface. This sampling location represents the most likely point for collection, infiltration, and migration off this parcel for runoff.
PPMP-233-GP05	Surface Soil Subsurface Soil Groundwater	Direct-push samples will be collected at a point in the southeastern section of the study parcel to determine if PSSC are present.
PPMP-233-GP06	Surface Soil Subsurface Soil Groundwater	Direct-push samples will be collected at a point midway along the southeastern boundary of the study parcel to determine if PSSC are present.
PPMP-233-GP07	Depositional Soil	Depositional soil sample will be collected near the natural drainage feature which runs parallel to Iron Mountain Road. Sampling location represents an area where contaminants may collect and potentially percolate into the substratum, or potentially deposit dissolved materials after evaporation.

^aSample locations will be based upon results of the surface geophysical survey and field observation.

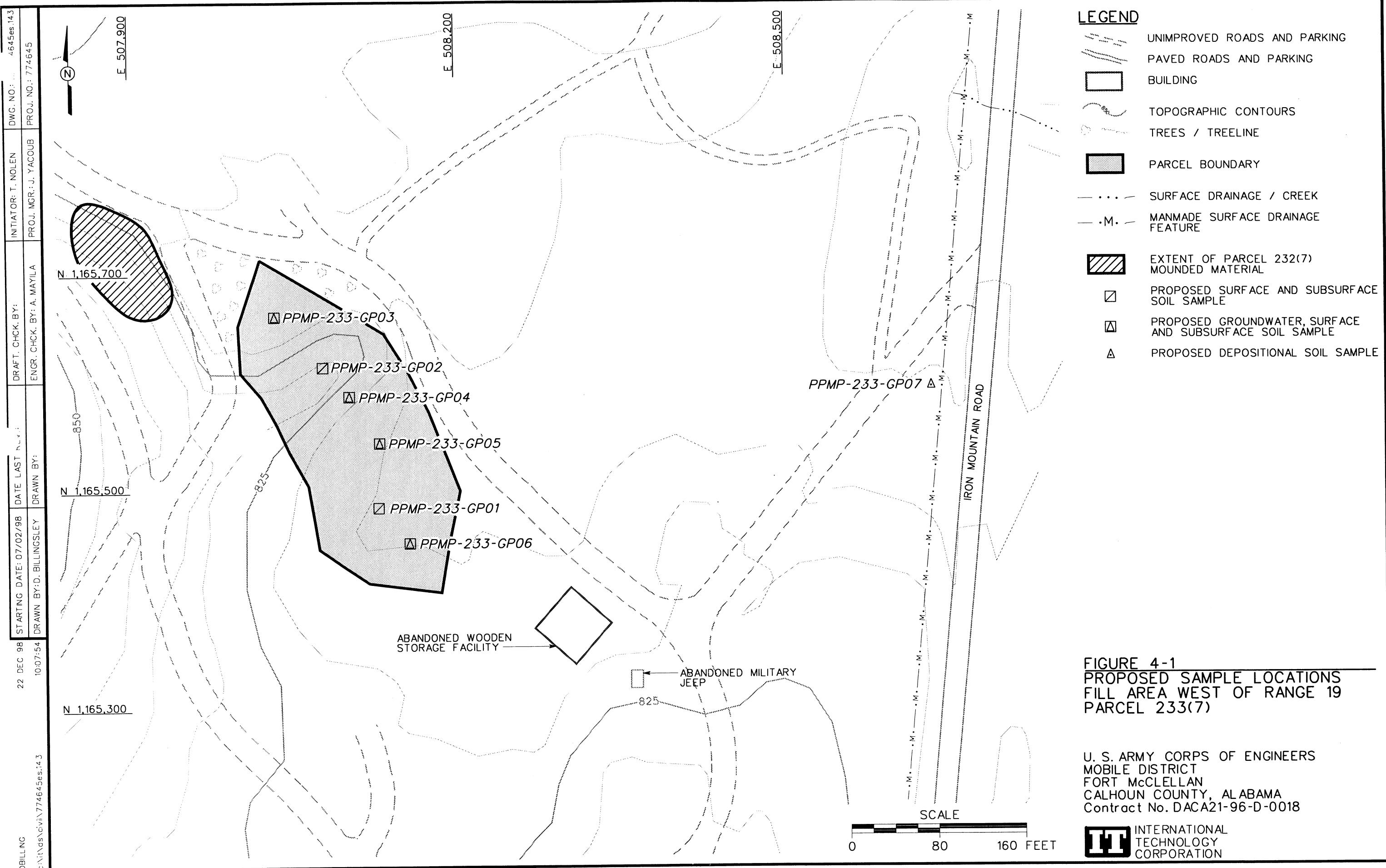


FIGURE 4-1
PROPOSED SAMPLE LOCATIONS
FILL AREA WEST OF RANGE 19
PARCEL 233(7)

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

IT INTERNATIONAL
TECHNOLOGY
CORPORATION

Table 4-2

Soil Sample Designations and QA/QC Sample Quantities
Fill Area West of Range 19, Parcel 23(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples		Analytical Suite
				Field Duplicates	Field Spills	
PPMP-233-GP01	PPMP-233-GP01-SS-KZ0001-REG	soil	0-1	PPMP-233-GP01-SS-KZ0002-FD	PPMP-233-GP01-SS-KZ0003-FS	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides
	PPMP-233-GP01-DS-KZ0004-REG	soil	a			
PPMP-233-GP02	PPMP-233-GP02-SS-KZ0005-REG	soil	0-1			PPMP-233-GP02-SS-KZ0005-MS
	PPMP-233-GP02-DS-KZ0006-REG	soil	a			PPMP-233-GP02-SS-KZ0005-MSD
PPMP-233-GP03	PPMP-233-GP03-SS-KZ0007-REG	soil	0-1			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides
	PPMP-233-GP03-DS-KZ0008-REG	soil	a			
PPMP-233-GP04	PPMP-233-GP04-SS-KZ0009-REG	soil	0-1			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides
	PPMP-233-GP04-DS-KZ0010-REG	soil	a			
PPMP-233-GP05	PPMP-233-GP05-SS-KZ0011-REG	soil	0-1			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides
	PPMP-233-GP05-DS-KZ0012-REG	soil	a			
PPMP-233-GP06	PPMP-233-GP06-SS-KZ0013-REG	soil	0-1			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides
	PPMP-233-GP06-DS-KZ0014-REG	soil	a			
PPMP-233-DEP01	PPMP-233-DEP01-DEP-K20015-REG	soil	0-1			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides

*Actual sample depth selected for analysis will be at the discretion of the site geologist and will be based on field observation.

FD - Field duplicate.

FS - Field spill.

MS/MSD - Matrix spike/matrix spike duplicate.

N/A - Not applicable.

PCB - Polychlorinated biphenyl.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.
TCL - Target compound list.
VOC - Volatile organic compound.

tions, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist based on actual field observations and the results of the geophysical survey.

4.3.2.2 Sample Collection

Subsurface soil samples will be collected from soil borings at a depth greater than 1 foot bgs in the unsaturated zone. The soil borings will be advanced and soil samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP.

Soil samples will be collected continuously for the first 12 feet, or until groundwater or refusal is reached. A detailed lithological log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field-screened using a PID in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings above background (readings in ambient air). Typically, the sample showing the highest reading will be selected and sent to the laboratory for analysis. If none of the samples indicate readings above background using the PID, then the deepest interval from the soil boring will be sampled and submitted to the laboratory for analyses. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSCs at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSC and/or additional sample data would provide insight to the existence of any PSSCs.

Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.3.3 Groundwater Sampling

Groundwater samples will be collected from four temporary monitoring wells installed at the Fill Area West of Range 19, Parcel 233(7).

4.3.3.1 Sampling Locations and Rationale

Groundwater samples will be collected from direct-push temporary wells installed at the site. Groundwater samples will be collected from the locations shown on Figure 4-1. The ground-

water sampling rationale is listed in Table 4-1. The groundwater sample designations, depths, and required QA/QC sample quantities are listed in Table 4-3. The exact sampling locations will be determined in the field by the on-site geologist based on actual field conditions and the results of the geophysical survey.

4.3.3.2 Sample Collection

Groundwater samples will be collected in accordance with the procedures and methods specified in Sections 4.7.1.1 of the SAP. Direct-push temporary wells will be completed in soil borings advanced into the water table (to a depth where sufficient water is encountered) to collect a groundwater sample.

At direct-push temporary well locations, where either refusal is reached before encountering water or direct-push temporary wells do not yield sufficient groundwater for laboratory analysis, conventional drilling methods will be utilized to install temporary monitoring wells. Temporary monitoring wells will be completed as specified in the addendum to Appendix C of the SAP, Section C.5.7 (IT, 1998c).

Sample documentation and chain of custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.6 of this SFSP.

4.3.4 Depositional Soil Sampling

One depositional soil sample will be collected at the Fill Area West of Range 19. The sample will be collected near the natural drainage feature east of Iron Mountain Road.

4.3.4.1 Sample Locations and Rationale

The sampling rationale is listed in Table 4-1. The proposed sampling location is shown in Figure 4-1. The depositional soil sample designation and required QA/QC sample quantities are listed in Table 4-2. The actual depositional soil sample location selected will be at the discretion of the ecological sampler based on the drainage pathways and on actual field observations.

Table 4-3

Groundwater Sample Designations and QA/QC Sample Quantities
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

Sample Location	Sample Designation	Sample Matrix	Sample Depth (ft)	QA/QC Samples		Analytical Suite
				Field Duplicates	Field Spikes	
PPMP-233-GP01	PPMP-233-GP01-GW-K23001-REG	groundwater	a	PPMP-233-GP01-GW-K23002-FD	PPMP-233-GP01-GW-K23003-FS	TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides
PPMP-233-GP02	PPMP-233-GP02-GW-K23004-REG	groundwater	a			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides
PPMP-233-GP03	PPMP-233-GP03-GW-K23005-REG	groundwater	a			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides
PPMP-233-GP04	PPMP-233-GP04-GW-K23006-REG	groundwater	a			TCL VOCs, TCL SVOCs, TAL Metals, Chlorinated Pesticides, PCBs, Chlorinated Herbicides, Organophosphorus Pesticides

* Sample depth will depend on where sufficient first water is encountered to collect a water sample.

FD - Field duplicate.

FS - Field split.

MS/MSD - Matrix spike/matrix spike duplicate.

N/A - Not applicable.

PCB - Polychlorinated biphenyl.

QA/QC - Quality assurance/quality control.

REG - Field sample.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

4.3.4.2 Sample Collection

The depositional soil sample will be collected in accordance with the procedures for surface soil sample collection specified in Section 4.9.1.1 of the SAP. Sample documentation and chain-of-custody will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SFSP are listed in Section 5.0, Table 5-1, of the QAP. The samples will be analyzed for the parameters listed in Section 4.6, which includes the addition of total organic carbon and grain size analyses.

4.4 Decontamination Requirements

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP. Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

4.5 Surveying of Sample Locations

Sampling locations will be marked with pin flags, stakes, and/or flagging and will be surveyed using either GPS or conventional civil survey techniques, as necessary, to obtain the required level of accuracy. Horizontal coordinates will be referenced to the Alabama State Plane Coordinate System, 1983 North American Datum (NAD83). Elevations will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for all soil, sediment, and surface water locations will be recorded using a GPS to provide accuracy within 1 meter. Temporary wells will be surveyed to an accuracy of 0.1 foot for horizontal coordinates and 0.01 feet for elevations, using survey-grade GPS techniques and/or conventional civil survey techniques, as required.

Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

4.6 Analytical Program

Samples collected at locations specified in this chapter will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as the EPA, ADEM, FTMC,

and USACE requirements. Target analyses for samples collected from the Fill Area West of Range 19, Parcel 233(7) consist of the following list of analytical suites:

- Target Compound List Volatile Organic Compounds - Method 5035/8260B
- Target Compound List Semivolatile Organic Compounds - Method 8270C
- Target Analyte List Metals - Method 6010B/7000
- Chlorinated Pesticides - Method 8081A
- Polychlorinated Biphenyls - Method 8082
- Chlorinated Herbicides - Method 8051A
- Organophosphorus Pesticides - Method 8141A.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-4 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines Level III criteria.

4.7 Sample Preservation, Packaging, and Shipping

Sample preservation, packaging, and shipping will follow the procedures as specified in Section 4.13.2 of the SAP. Completed analysis request/chain-of-custody records will be secured and included with each shipment of coolers to the following subcontract laboratory:

Sample Receiving
Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Telephone: (423) 588-6401.

Split samples collected for the USACE laboratory will be shipped to the following address:

USACE South Atlantic Division Laboratory
Attn: Sample Receiving
611 South Cobb Drive
Marietta, Georgia 30060
Telephone: (770) 919-5270.

4.8 Investigation-Derived Waste Management

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP. The IDW expected to be generated at the

Table 4-4

**Analytical Samples
Site Investigation
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples			QA/QC Samples ^a			Quanterra Total No. Analysis	QA Lab Total No. Analysis
				No. of Sample Points	No. of Events	Field Dups (10%)	Splits w/ QA Lab (5%)	MS/MSD Trip Blank ^b (1/wk/matrix)	Eq. Rinse (1/wk/matrix)		
Fill Area West of Range 19: 4 groundwater samples; 13 soil matrix samples (6 surface soil samples, 6 subsurface soil samples, and one 1 depositional soil sample)											
TCL VOCs	8260B	water	normal	4	1	4	1	1	1	1	1
TCL SVOCs	8270C	water	normal	4	1	4	1	1	1	1	8
Cl Pesticides	8081A	water	normal	4	1	4	1	1	1	1	8
PCBs	8082	water	normal	4	1	4	1	1	1	1	8
OP Pesticides	8141A	water	normal	4	1	4	1	1	1	1	8
Cl Herbicides	8151A	water	normal	4	1	4	1	1	1	1	8
Tot TAL Metals	6010B/7000	water	normal	4	1	4	1	1	1	1	8
TCL VOCs	8260B	soil	normal	13	1	13	1	1	1	1	17
TCL SVOCs	8270C	soil	normal	13	1	13	1	1	1	1	17
Cl Pesticides	8081A	soil	normal	13	1	13	1	1	1	1	17
PCBs	8082	soil	normal	13	1	13	1	1	1	1	17
OP Pesticides	8141A	soil	normal	13	1	13	1	1	1	1	17
Cl Herbicides	8151A	soil	normal	13	1	13	1	1	1	1	17
TAL Metals	6010B/7000	soil	normal	13	1	13	1	1	1	1	17
Fill Area West of Range 19 Subtotal:				119	14	14	2	14	177	14	

^aField duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded to the nearest whole number.
^bTrip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

Ship samples to:

Quanterra Environmental Services
5815 Middlebrook Pike
Knoxville, Tennessee 37921
Attn: John Reynolds
Tel: 423-588-6401
Fax: 423-584-4315

USACE laboratory split samples
are shipped to:

USACE South Atlantic Division Laboratory
Attn: Sample Receiving
611 South Cobb Drive
Marietta, Georgia, 30060-3112
Tel: 770-919-5270

QA/QC - Quality assurance/quality control.
 MS/MSD - Matrix spike/matrix spike duplicate.
 VOC - Volatile organic compound.
 SVOC - Semivolatile organic compound.

TAL - Target analyte list.
 Pest - Pesticides.
 Cl - Chlorinated.
 OP - Organophosphorus.

CA - Chemical agent.
 TCL - Target compound list.
 PCB - Polychlorinated biphenyls.

Fill Area West of Range 19, Parcel 233(7) will include decontamination fluids and disposable personal protective equipment. The IDW will be staged in the fenced area surrounding Buildings 335 and 336 while awaiting analytical results prior to final disposal.

4.9 Site-Specific Safety and Health

Safety and health requirements for this SI are provided in the SSHP attachment for the Fill Area West of Range 19, Parcel 233(7). The SSHP attachment will be used in conjunction with the SHP.

5.0 Project Schedule

The project schedule for the SI activities is provided by the IT project manager to the Base Realignment and Closure Cleanup Team on a monthly basis.

6.0 References

Environmental Science and Engineering Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Fort McClellan (FTMC), 1997, *Fort McClellan Comprehensive Reuse Plan*, prepared under contract to the Calhoun County Commission, November

IT Corporation (IT), 1998a, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, August.

IT Corporation (IT), 1998b, *Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama*, August.

U.S. Army Corps of Engineers (USACE), 1998, *Statement of Work for Task Order CK005, Modification No. 1, Site Investigations at Fort McClellan, Alabama, Including Ecological Screening Sites (Creeks and Tribs), and Removal of Indoor Firing Ranges*, May.

U.S. Army Corps of Engineers (USACE), 1994, *Requirements for the Preparation of Sampling and Analysis Plans*, Engineer Manual EM 200-1-3, September 1.

U.S. Department of Agriculture (USDA), 1961, *Soil Survey, Calhoun County, Alabama*, USDA Soil Conservation Service in cooperation with Alabama Department of Agriculture and Industries, Alabama Agricultural Experiment Station, Series 1958, No.9, September.

U.S. Environmental Protection Agency (EPA), 1993, *Data Quality Objectives Process for Superfund, Interim Final Guidance*, EPA 540-R-93-071, September.

Site-Specific Safety and Health Plan ---

Fill Area West of Range 19, Parcel 233(7)

**Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562**

Prepared for:

**U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602**

Prepared by:

**IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923**

**Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645**

December 1998

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Final
Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Fill Area West of Range 19, Parcel No. 233(7) at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Jeanne Yacoub, PE
Project Manager

12/22/98
Date

Michael Henderson, CIH
Michael Henderson, CIH
Health & Safety Manager

December 22, 1998
Date

Ben Redmond
Ben Redmond
UXO Specialist

12/22/98
Date

Jeff Tarr, P.G.
Jeff Tarr, P.G.
Site Coordinator

12/20/98
Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Fill Area West of Range 19, Parcel No. 233(7) at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Project Manager

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.



Jeff H. Tan

Site Coordinator



Date

Site-Specific Safety and Health Plan Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in this site-specific safety and health plan attachment for the activities at the Fill Area West of Range 19, Parcel No. 233(7) at Fort McClellan, Calhoun County, Alabama.

Printed Name

Signature

Representing

Date

Fort McClellan Gate Hours

Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.
---------------	---

Fort McClellan Project Emergency Contacts

Fire Department (on post)	Ext. 17
Fire Department (off post)	(256) 820-1117
Ambulance (on post)	Ext. 12
Ambulance (off post)	(256) 848-2315
Military Police (on post)	Ext. 5-3821
Military Police (off post).....	(256) 848-5555
Regional Medical Center	(256) 235-5121
Chemical Agent Emergencies	Ext. 17
UXO Emergencies	Ext. 17
UXO Nonemergencies/Reporting Only (Ronald Levy)	(256) 848-3758
National Response Center.....	(800) 424-8802
Poison Control Center.....	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management.....	(256) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(423) 690-3211
Michael Henderson, IT H&S Manager	(423) 690-3211
Dr. Elaine Theriault, IT Occupational Physician	(800) 229-3674

Table of Contents

	<i>Page</i>
List of Tables	ii
List of Figures	ii
List of Acronyms.....	iii
1.0 Site Work Plan Summary.....	1
2.0 Site Characterization and Analysis	2
2.1 Anticipated Hazards	2
2.2 General Site Information.....	2
3.0 Personal Protective Equipment	3
4.0 Site Monitoring	5
5.0 Activity Hazard Analysis	6

List of Tables ---

<i>Number</i>	<i>Title</i>	<i>Follows Page</i>
2-1	Toxicological and Physical Properties of Chemicals	2
4-1	Action Levels	5
4-2	Air Monitoring Frequency and Location	5
5-1	Activity Hazard Analysis	6

List of Figures ---

<i>Number</i>	<i>Title</i>	<i>Follows Page</i>
1-1	Hospital Location Map	6

List of Acronyms ---

FTMC	Fort McClellan
PPE	personal protective equipment
SHP	installation-wide safety and health plan
SSHO	site safety and health officer
SSHSP	site-specific safety and health plan
UXO	unexploded ordnance

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at the Fill Area West of Range 19, Parcel No. 233(7) at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the parcel and compute the site relative risk.

Project Tasks

- Collect six surface soil samples.
- Collect six subsurface soil samples.
- Install four temporary wells.
- Collect four groundwater samples
- Collect one depositional soil sample.

Personnel Requirements. Up to ten employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific SHP (SSHP). This SSHP must be used in conjunction with the SHP.

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

This Fill Area consists of an area less than 1 acre in size. The site is approximately 200 feet long, northeast to southwest, and 100 to 150 feet wide, northwest to southeast. Although documentation on past operations at the site is not available, rocks, metal debris, drums, and other miscellaneous debris have been observed at the site. The site is wooded and vegetation in the area is sparse.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the Fill Area North of Landfill No. 2 site.

The presence of unexploded ordnance (UXO) is suspected at the Fill Area West of Range 19.

2.2 General Site Information

Location and Approximate Size of Site. The Fill Area West of Range 19, Parcel 233(7) is located in the southeastern area of the FTMC approximately 550 feet west of Iron Mountain Road. The parcel is located immediately west of an asphalt road that loops to the west of the site. A wooden storage facility is located approximately 100 feet south of the site.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. The site elevation ranges from 818 feet to 823 feet and slopes to the southeast.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater and soils.

Table 2-1

Toxicological and Physical Properties of Chemicals
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Acetone [67-64-1]	9.7	13-100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention	750 ppm 750 ppm 250 ppm	1,000 ppm 1,000 ppm	PEL TLV REL	20,000 ppm
Benzene [71-43-2]	9.24	34-119	Inh Abs Ing Con	Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention	1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm	5 ppm C1 ppm (Ca)	PEL TLV REL	Ca [1,000 ppm] *OSHA
Ethanol	9.51	NA	Inh Ing Con	Irritated eyes, skin, nose; headache; cough, liver damage; anemia.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention	1,000 ppm 1,000 ppm 1,000 ppm	-- -- --	PEL TLV REL	3,300 ppm (LEL)
Ethyl benzene [100-41-4]	8.76	0.09-0.6	Inh Ing Con	Irritates eyes, mucous membranes; headache; dermatitis; narcosis, coma.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Respiratory support Immediate medical attention	100 ppm 100 ppm 100 ppm	125 ppm 125 ppm 125 ppm	PEL TLV REL	2,000 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	[DLH (NIOSH) ^f
Fuel oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, substernal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Irrigate promptly Skin: Respiratory support Breath: Immediate medical attention Swallow: Aspiration: Immediate medical Attention			PEL TLV REL	
Fuel Oil No. 1, see kerosene. [NA]								PEL TLV REL	
Fuel Oil No. 2, see fuel oil. [NA]								PEL TLV REL	
Fuel Oils No. 4, 5, and 6 [NA]	?	?	Abs Con	Low toxicity; prolonged contact may produce systemic effects.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	

Table 2-1

Toxicological and Physical Properties of Chemicals
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 3 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Kerosene	?	?	Inh Ing Con	Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakness; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention	100 mg/m ³		PEL TLV REL	
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose, throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Skin: Breath: Swallow: Irrigate immediately (15 min) Soap wash promptly Respiratory support Immediate medical attention	300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	?
n-Hexane [110-54-3]	10.18	65-248	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention	50 ppm 50 ppm 50 ppm		PEL TLV REL	5,000 ppm
Hydrogen chloride (hydrochloric acid) [74-90-8]	12.74	0.255-10.6	Inh Ing Con	Infamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush immediately Respiratory support Immediate medical attention	C5 ppm C5 ppm C5 ppm		PEL TLV REL	100 ppm
Isopropyl alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush Respiratory support Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	12,000 ppm

Table 2-1
Toxicological and Physical Properties of Chemicals
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 4 of 8)

Substance [CAS]	I ^P ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	[DLH (NIOSH)]
Lead	NA	NA	Inh Ing Con	Weak, Insomnia, facial pallor, constipated, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention	0.05 mg/m 0.05 mg/m 0.1 mg/m	PEL TLV REL	100 mg/m	
Mercuric cyanide	NA	NA	Inh Ing Con	Violent poison. Highly toxic.	Eye: Skin: Breath: Swallow: Irrigate immediately Immediate medical attention Soap wash immediately Immediate medical attention Respiratory support Immediate medical attention Immediate medical attention	-- -- -- --	PEL TLV REL	--	
Methanol	10.85	4.2-5960	Inh Abs Ing Con	Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention	200 ppm (skin) 200 ppm (skin) 200 ppm	PEL TLV REL	25,000 ppm	
Methylene chloride (dichloromethane) [75-09-2]	11.32	?	Inh Ing Con	Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention	500 ppm 50 ppm	C1,000 ppm; C2,000 mg/m ³ (5 min in 2 hrs)	PEL TLV REL	Ca (5,000 ppm)

Table 2-1

Toxicological and Physical Properties of Chemicals
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 5 of 8)

Substance [CAS]	IP ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TVA ^c	STEL ^d	Source ^e	[DLH (NIOSH)]
Methyl ethyl ketone [78-93-3]	9.54	2-85	Inh Ing Con	Irritated eyes and nose; headache, dizziness; vomiting.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Fresh air Immediate medical attention	200 ppm 200 ppm 200 ppm	300 ppm 300 ppm 300 ppm	PEL TLV REL	3,000 ppm
Motor oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Skin: Swallow: Irrigate immediately (15 min) Soap wash immediately Immediate medical attention			PEL TLV REL	
Naphtha, see petroleum distillate									
Nitric acid [7697-37-2]	11.95	0.3-1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush promptly Respiratory support Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	100 ppm
Petroleum distillate (Naphtha) [8002-05-9]	?	?	Con Ing	Coughing, dyspnea, nausea, or vomiting.		400 ppm		PEL TLV REL	
Petroleum hydrocarbons, see Stoddard solvent									

Toxicological and Physical Properties of Chemicals
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 6 of 8)

Table 2-1

Substance [CAS]	I ^p ^a (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Portland cement			Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention	10 mg/m ³ 10 mg/m ³ /total dust 5 mg/m ³ respirable fraction		TLV PEL/REL	
Sodium hydroxide [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes and skin; temporary loss of hair.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush immediately Respiratory support Immediate medical attention	C2 mg/m ³ C2 mg/m ³ C2 mg/m ³	PEL TLV REL	250 mg/m ³	
Sulfuric acid [7664-93-9]	?	0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Skin: Breath: Swallow: Irrigate immediately Water flush immediately Respiratory support Immediate medical attention	1 mg/m ³ 1 mg/m ³ 1 mg/m ³	3 mg/m ³	PEL TLV REL	80 mg/m ³
Stoddard Solvent	?	?	Inh Ing Con	Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash immediately Respiratory support Immediate medical attention	500 ppm 350 mg/m ³		PEL TLV REL	20,000 mg/m ³
Toluene [108-88-3]	8.82	0.16-37	Inh Abs Ing Con	Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis.	Eye: Skin: Breath: Swallow: Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention	100 ppm 50 ppm (skin) 100 ppm	150 ppm 150 ppm	PEL TLV REL	2,000 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 7 of 8)

Substance [CAS]	I ^p (eV)	Odor Threshold (ppm)	Route ^b	Symptoms of Exposure	Treatment	TWA ^c	STEL ^d	Source ^e	IDLH (NIOSH) ^f
Xylene (o-, m-, and p-isomers) [1330-20-7;95-47-6; 108-38-3;106-42-3]	8.56/ 8.56/ 8.44	1.1-20	Inh Abs Ing Con	Dizziness, excitement, drowsiness, incoordination, staggering gait; Irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.	Eye: Skin: Breath: Swallow:	Irrigate immediately Soap wash promptly Respiratory support Immediate medical attention	100 ppm 100 ppm 100 ppm	150 ppm 150 ppm 150 ppm	PEL TLV REL

^aI^p = Ionization potential (electron volts).

^bRoute = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
^cTWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.

^dSTEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.

^ePEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).

AEL = Airborne Exposure Limit.

TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.

REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.

^fIDLH (NIOSH)—immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.

NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 97-140, 1997).

C = Ceiling limit value which should not be exceeded at any time.

Ca = Carcinogen.

NA = Not applicable.

? = Unknown.

LEL = Lower explosive limits.

LC₅₀ = Lethal concentration for 50 percent of population tested.

LD₅₀ = Lethal dose for 50 percent of population tested.

NIC = Notice of intended change (ACGIH).

Table 2-1

**Toxicological and Physical Properties of Chemicals
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama**

(Page 8 of 8)

References:

- American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.
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- Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
- Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
- Verschueren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
- Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association, 1992.
- Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment	Level D
Collecting samples	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone are greater than action levels.

Level D. The minimal level of protection that will be required of IT Corporation personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from the Fill Area West of Range 19 operations are unknown. Table 4-1 contains action levels for site monitoring at the Fill Area.

Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and breathing zones to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas indicator/oxygen monitor will be utilized to monitor the work area and personnel breathing zones for combustible/flammable gases and oxygen levels. Table 4-2 contains the air monitoring frequency and location for site monitoring at the Fill Area West of Range 19.

UXO. The UXO specialists will perform UXO avoidance sweeps prior to moving the heavy equipment onto the site. During this operation, UXO on the surface will be detected and marked for avoidance during field operations. Additionally, downhole magnetometer surveys will be performed to detect objects in the path of the boring apparatus. The boring location will be moved to avoid subsurface metal objects.

If UXO is encountered, personnel will contact the UXO specialist immediately. Personnel will evacuate the immediate area and secure it.

Table 4-1
Action Levels
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 2)

When in Level C PPE

Analyte	Action Level	Required Action ^a
VOHs	≥ 10 ppm above background in BZ	Stop work, evacuate work area, upgrade to Level B.
Benzene	≥ 5 ppm in BZ	Stop work, evacuate work area, upgrade to Level B.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

When in Level D Modified/D PPE

Analyte	Action Level	Required Action ^b
VOHs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Benzene	1 ppm in BZ	Upgrade to Level C PPE.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

Table 4-1
Action Levels
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 2)

When in Support Zone

Analyte	Action Level	Required Action ^a
VOHs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

^a Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

^b Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

**Air Monitoring Frequency and Location
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama**

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	Breathing zone (BZ) of employees
Sampling (groundwater and soil)	OV Monitor LEL/O ₂ Monitor	Continuously Continuously	BZ of employees Support zone

OV = Organic vapor.

LEL/O₂ = Lower explosive level/oxygen.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil and groundwater sampling.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 1 of 12)

Activity	Potential Hazards	Recommended Controls
Staging Equipment	Slip, trip, and fall hazards	<ul style="list-style-type: none"> Determine best access route before transporting equipment. Practice good housekeeping; keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip, and fall hazards. Look before you step; ensure safe and secure footing.
Heavy lifting		<ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
Falling objects		<ul style="list-style-type: none"> Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
Flying debris, dirt, dust, etc.		<ul style="list-style-type: none"> Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
Pinch points		<ul style="list-style-type: none"> Keep hands, fingers, and feet clear of moving/suspended materials and equipment. Beware of contact points. Stay alert at all times!
Cuts/bruises		<ul style="list-style-type: none"> Use cotton or leather work gloves for material handling.
Bees, spiders, and snakes		<ul style="list-style-type: none"> Inspect work area carefully and avoid placing hands and feet into concealed areas.
Ticks		<ul style="list-style-type: none"> Wear light colored clothing (can see ticks better). Mow vegetated and small brush areas. Wear insect repellent. Wear long sleeves and long pants. Visually check oneself promptly and frequently after exiting the work area.
Fire		<ul style="list-style-type: none"> Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
Hazard communication		<ul style="list-style-type: none"> Label all containers as to contents and dispose of properly. Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 2 of 12)

Activity	Potential Hazards	Recommended Controls
Staging Equipment (continued)		
Noise	<ul style="list-style-type: none"> • Sound levels above 85 decibels (dBA) mandates hearing protection. 	
Lighting	<ul style="list-style-type: none"> • Adequate lighting will be provided to ensure a safe working environment. 	
Cold stress	<ul style="list-style-type: none"> • Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). • Drink warm beverages on breaks. • Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing. 	
Poison ivy/oak/sumac	<ul style="list-style-type: none"> • Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water. 	
Heat rash	<ul style="list-style-type: none"> • Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area. 	
Heat cramps	<ul style="list-style-type: none"> • Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area. 	
Heat exhaustion	<ul style="list-style-type: none"> • Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the "buddy system." • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks. 	
Heat stroke	<ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices. 	

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 3 of 12)

Activity	Potential Hazards	Recommended Controls
Staging Equipment (continued)	Contact with moving equipment/vehicles	<ul style="list-style-type: none">• Work area will be barricaded/demarcated.• Equipment will be laid out in an area free of traffic flow.• Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic.• Barrriers shall be used to protect workers from vehicular traffic.• Barrriers shall be used to guard excavations adjacent to streets or roadways.• Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided.• Heavy equipment shall have backup alarms.
Forklift operations		<ul style="list-style-type: none">• Use qualified and trained forklift operators.• The operator shall not exceed the load capacity rating for the forklift.• The load capacity shall be clearly visible on the forklift.• Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
Portable electric tools		<ul style="list-style-type: none">• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service.• Portable electric tools and all cord and plug connected equipment shall be protected by a ground fault circuit interrupter device.• Electrical tools shall be inspected daily prior to use.
Extension cords		<ul style="list-style-type: none">• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service.• Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic.• Cords shall be suspended with a nonconductive support (rope, plastic ties, etc.).• Cords shall be designed for hard duty.• Cords shall be inspected daily.

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 4 of 12)

Activity	Potential Hazards	Recommended Controls
Staging Equipment (continued)	<p>Lightning strikes</p> <ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one. • Keep all body parts in contact with the ground as close as possible. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people. 	
Thunderstorms, tornadoes	<ul style="list-style-type: none"> • Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorm or tornado warnings. • Seek shelter. Do not try to outrun a tornado. 	
UXO	<ul style="list-style-type: none"> • UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. • If UXO is encountered, cease all activities, mark the location, and notify the site manager. 	
Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. • Provide adequate lighting in all work areas. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls. • Work areas will be kept clean and orderly. • Garbage and trash will be disposed of daily in approved refuse containers. • Tools and accessories will be properly maintained and stored. • Work areas and floors will be kept free of dirt, grease, and slippery materials. 	
Surveying		
Traffic accidents	<ul style="list-style-type: none"> • Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. • Pedestrians have the right-of-way. • Wear seat belts when vehicles are in motion. 	

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 5 of 12)

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Wildlife hazards • Workers should be cautious when driving through the site in order to avoid encounters with passing animals. Biological hazards • When walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).	
Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellent. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.	
Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.	
UXO	• UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. • If UXO is encountered, cease all activities, mark the location, and notify the site manager.	
Groundwater Sampling	Cross-contamination and contact with potentially contaminated materials	• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Avoid skin contact with water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
Cut hazards		• Use care when handling glassware. • Wear adequate hand protection.
Hazard communication		• MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents.

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 6 of 12)

Activity	Potential Hazards	Recommended Controls
Groundwater Sampling (continued)	Strains/sprains	<ul style="list-style-type: none"> • Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Spills/residual materials	<ul style="list-style-type: none"> • Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	<ul style="list-style-type: none"> • Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	<ul style="list-style-type: none"> • Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.
Soil Boring (Surface/Subsurface Sampling)	Cross-contamination and contact with potentially contaminated materials	<ul style="list-style-type: none"> • Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	<ul style="list-style-type: none"> • Use care when handling glassware. • Wear adequate hand protection.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls.

Table 5-1

**Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama**

(Page 7 of 12)

Activity	Potential Hazards	Recommended Controls
Soil Boring (Surface/Subsurface Sampling) (continued)	Bees, spiders, and snakes	<ul style="list-style-type: none">• Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas.• Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.•
	Poison ivy/oak/sumac	<ul style="list-style-type: none">• Avoid plant areas if possible.• Wear long sleeves and long pants.• Promptly wash clothing that has contacted poisonous plants.• Wash affected areas immediately with soap and water.
	Cold stress	<ul style="list-style-type: none">• Workers should wear insulated clothing when temperatures drop below 40°F.• Drink warm beverages on breaks. Refrain from drinking caffeinated beverages.• Remove wet clothing promptly.• Take breaks in warm areas.• Reduce work periods as necessary.• Layer work clothing.
	Access/egress hazards	<ul style="list-style-type: none">• Use qualified and trained bushhog operator.• Keep employees out of the bushhog work area.• Utilize good housekeeping practices.• Keep aisleways, pathways, and work areas free of obstruction.• Clean ice or snow off of walkways or work stations.• Use appropriate footwear for the task assigned.
	Heat rash	<ul style="list-style-type: none">• Keep the skin clean and dry.• Change perspiration-soaked clothing, as necessary.• Bathe at end of work shift or day.• Apply powder to affected area.
	Heat cramps	<ul style="list-style-type: none">• Drink plenty of cool fluids even when not thirsty.• Provide cool fluid for work crews.• Move victim to shaded, cool area.

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 8 of 12)

Activity	Potential Hazards	Recommended Controls
Soil Boring (Surface/Subsurface Sampling) (continued)	<p>Heat exhaustion</p> <ul style="list-style-type: none"> • Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the buddy system. • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks. <p>Heat stroke</p> <ul style="list-style-type: none"> • Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices. <p>Lightning strikes</p> <ul style="list-style-type: none"> • Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people. 	
UXO		<ul style="list-style-type: none"> • UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. • If UXOs are encountered, cease all activities, mark the location, and notify the site manager.
Moving and Shipping Collected Samples	<p>Heavy lifting</p> <p>Pinch points</p> <p>Cut hazards</p>	<ul style="list-style-type: none"> • Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift. • Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times! • Wear adequate hand protection. Use care when handling glassware.

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 9 of 12)

Table 5-1

Activity	Potential Hazards	Recommended Controls
Moving and Shipping Collected Samples (continued)	Hazard communication	<ul style="list-style-type: none"> Label all containers as to contents and associated hazards.
	Heavy lifting	<ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
Material Storage	Flammable and combustible liquids	<ul style="list-style-type: none"> Store in NO SMOKING AREA. Fire extinguisher readily available. Transfer only when properly grounded and bonded.
Disposal of Investigation-Derived Waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	<ul style="list-style-type: none"> Use qualified and trained forklift operators. The operator shall not exceed the load capacity rating for the forklift. The load capacity shall be clearly visible on the forklift. Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
Cross-contamination and contact with potentially contaminated materials		<ul style="list-style-type: none"> Stop immediately at any sign of obstruction. Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. Only essential personnel will be in the work area. Real-time air monitoring will take place before and during sampling activities. All personnel will follow good hygiene practices. Proper decontamination procedures will be followed. All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
Cut hazards		<ul style="list-style-type: none"> Use care when handling glassware. Wear adequate hand protection.

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 10 of 12)

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations	Heavy lifting	<ul style="list-style-type: none"> • Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> • Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards.
High-Pressure Water Jetting Operations (continued)	Fuelling	<ul style="list-style-type: none"> • Only approved safety cans shall be used to store fuel. • Do not refuel equipment while it is operating. • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	<ul style="list-style-type: none"> • Equipment shall be inspected before being placed into service and at the beginning of each shift. • Preventive maintenance procedures recommended by the manufacturer shall be followed. • A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	<ul style="list-style-type: none"> • Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). • One standby person shall be available within the vicinity of the pump during jetting operation. • The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	<ul style="list-style-type: none"> • Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	<ul style="list-style-type: none"> • No machinery or equipment is permitted to run unattended. • Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	<ul style="list-style-type: none"> • Sound levels above 85 dBA mandates hearing protection by nearby site personnel.

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 11 of 12)

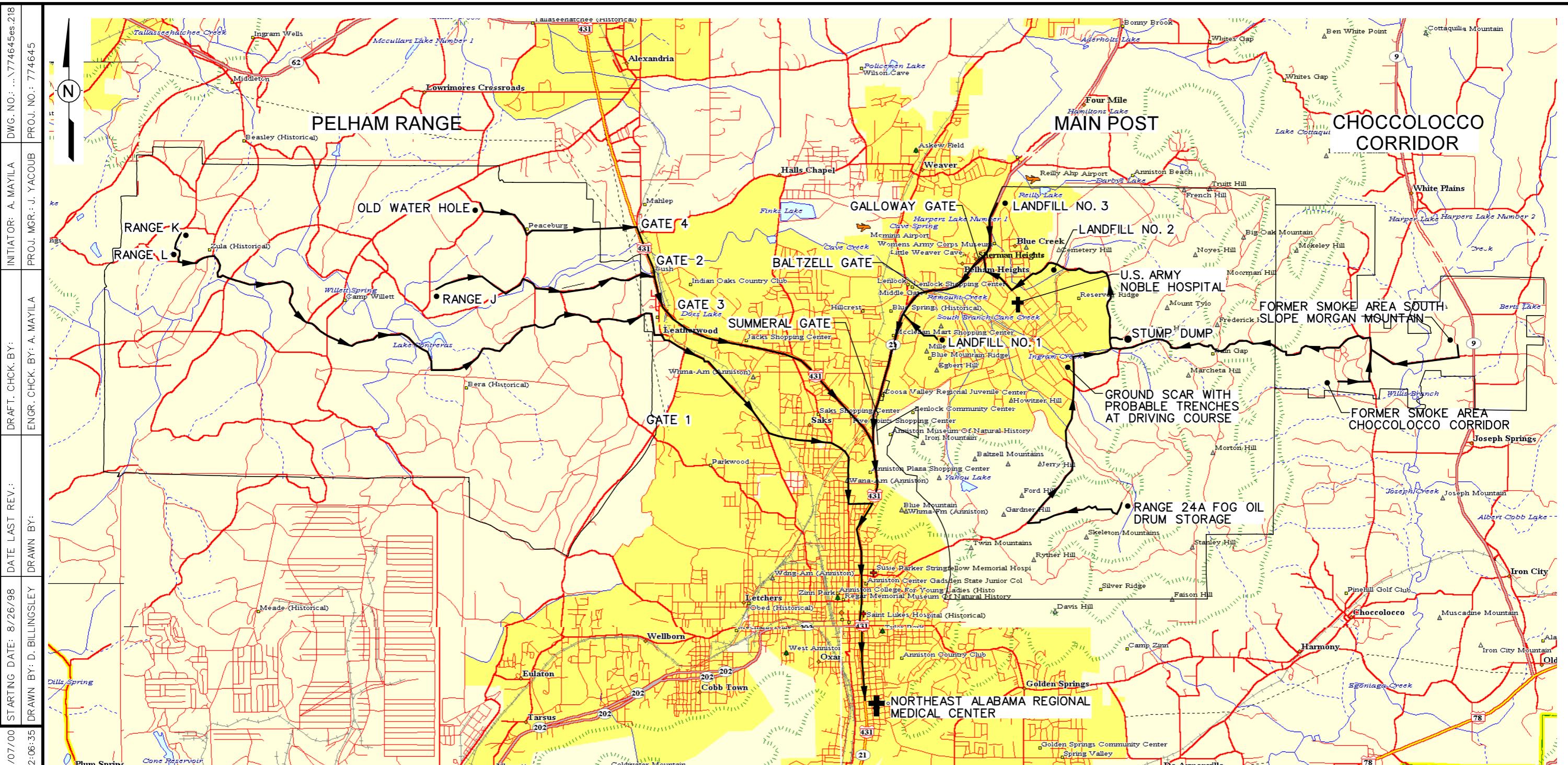
Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Activation during repairs Pinch points Falling objects Flying debris Contact with potentially contaminated materials Hydropunch Sampling	<ul style="list-style-type: none"> All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done. Keep feet and hands clear of moving/suspended materials and equipment. Stay alert and clear of materials suspended. Hard hats are required by site personnel. Stay alert and clear of material suspended overhead. Impact-resistant safety glasses with side shields are required. All site personnel will wear the appropriate PPE. All machinery or mechanized equipment will be inspected by a competent mechanic and certified to be in safe operating condition. Equipment will be inspected before use and at the beginning of each shift. Faulty/unsafe equipment will be tagged and if possible locked out. Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so. Faulty or damaged equipment being utilized to perform work Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. All mobile equipment and areas in which they are operated shall be adequately illuminated. Whenever the equipment is parked, the parking brake shall be set. Equipment parked on inclines will have the wheels chocked. Inspect brakes and tire pressure on drill rig before staging for work. Obtain trenching/drilling permit prior to operation. Machinery and mechanized equipment shall be operated only by designated personnel. Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement.
Inexperienced operator		

Table 5-1

Activity Hazard Analysis
Fill Area West of Range 19, Parcel 233(7)
Fort McClellan, Calhoun County, Alabama

(Page 12 of 12)

Activity	Potential Hazards	Recommended Controls
Hydropunch Sampling (continued)	Jacks/outriggers	<ul style="list-style-type: none"> Ensure proper footing and cribbing.
	Falling objects	<ul style="list-style-type: none"> Remove unsecured tools and materials before raising or lowering the derrick. Stay alert and clear of materials suspended overhead.
	Pinch points	<ul style="list-style-type: none"> Keep feet and hands clear of moving/suspended materials and equipment. Stay alert at all times!
	Fire	<ul style="list-style-type: none"> Mechanized equipment shall be shut down prior to and during fueling operations. Have fire extinguishers inspected and readily available.
	Fall hazards	<ul style="list-style-type: none"> Personnel are not allowed to work off of machinery or use them as ladders. Use fall protection when working above 6 feet.
	Noise	<ul style="list-style-type: none"> Hearing protection is mandatory above 85 dBA.
	Contact with rotating or reciprocating machine part	<ul style="list-style-type: none"> Use machine guards; use long-handled shovels to remove auger cuttings. Safe lockout procedures for maintenance work.
	Heavy lifting	<ul style="list-style-type: none"> Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	<ul style="list-style-type: none"> Practice good housekeeping; keep work area picked up and clean as feasible. Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	<ul style="list-style-type: none"> Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.
	UXO	<ul style="list-style-type: none"> UXO avoidance monitoring will be conducted by a UXO specialist prior to beginning activities. If UXO is encountered, cease all activities, mark the location, and notify the site manager.



LEGEND:

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- U.S. HIGHWAY
- ⊕ HOSPITALS
- INVESTIGATION SITES

FIGURE 1
HOSPITAL EMERGENCY ROUTES

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018